

# MontCAS Data Analysis & Support Tools



*A DISCUSSION AND DEMONSTRATION OF  
TOOLS TO SUPPORT MONTCAS DATA  
ANALYSIS & PREPARATION*

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# Agenda

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A	B	C	D	E	F	G	H	I	J	K	L
	TOTAL =	117	# Correct	39	74	84	43	70	0.73	0.52	1.77
	Threshold =	50%	% Correct	33%	63%	72%	37%	60%	73%	52%	44%
	Problem # (Click to see problem):			10	12	13	14	15	18	19	23
			Standard	2	7	2	4	7	2	3	3
	Numbers & Operations		2	33%		72%			73%		
	Algebra		3							52%	44%
	Geometry		4				27%				
	Measurement		5								
	Data Analysis, Statistics & Probability		6					6			
	Patterns, Relations & Functions		7								

Student Name	First Name	08-09 Math	Student ID	10	12	13	14	15	18	19	23
ERRO	JESSE	MATH 2	799440459	1	1	1	1	1	0	1	0
PERSON	RYAN	MATH 1	620032041	B	1	1	C	1	1	1	0
PERSON	TYLER	MATH 1	826866009	B	1	1	C	C	0	0	2

Polson High School											
MontCAS Mathematics Review											
HOME	PROBLEMS	WORKSHEETS	ASSESSMENTS	MARS REPORTING	MONTANA OPI	OTHER STUFF					
Grade 10	Grade 8	Grade 7	Grade 6	Grade 5	Grade 4	Grade 3					
MontCAS 10th Grade Review											
#	Year	STD	PSD%	MT%	Delta	Type	Topic				
1	2006						Scientific Notation				
4	2008						Trigonometry				
9	2008						Exponential Functions				
10	2008						Exponential Functions				
10	2009	2	33%	66%	1	MC	Linear Functions				
12	2008	7				999	MC	Linear Functions			
12	2009	7	63%	56%	7	MC	Functions				
13	2009	2	72%	66%	6	MC	Scientific Notation				
14	2008	2				999	MC	Rational Numbers			
14	2009	4	37%	40%	-3	MC	Trigonometry				
15	2009	7	60%	45%	15	MC	Linear Functions				
18	2009	2	73%	50%	23	CR	Order of Operations				
19	2009	3	52%	50%	2	CR	Writing & Solving Equations				

- PHS MontCAS Math Background
- MS Excel for Enhanced Data Analysis
- Web-based Tools to Support Test Preparation
- Experience & Lessons Learned
- How Others Can Use & Support Tool Development

# PHS MontCAS Math Background

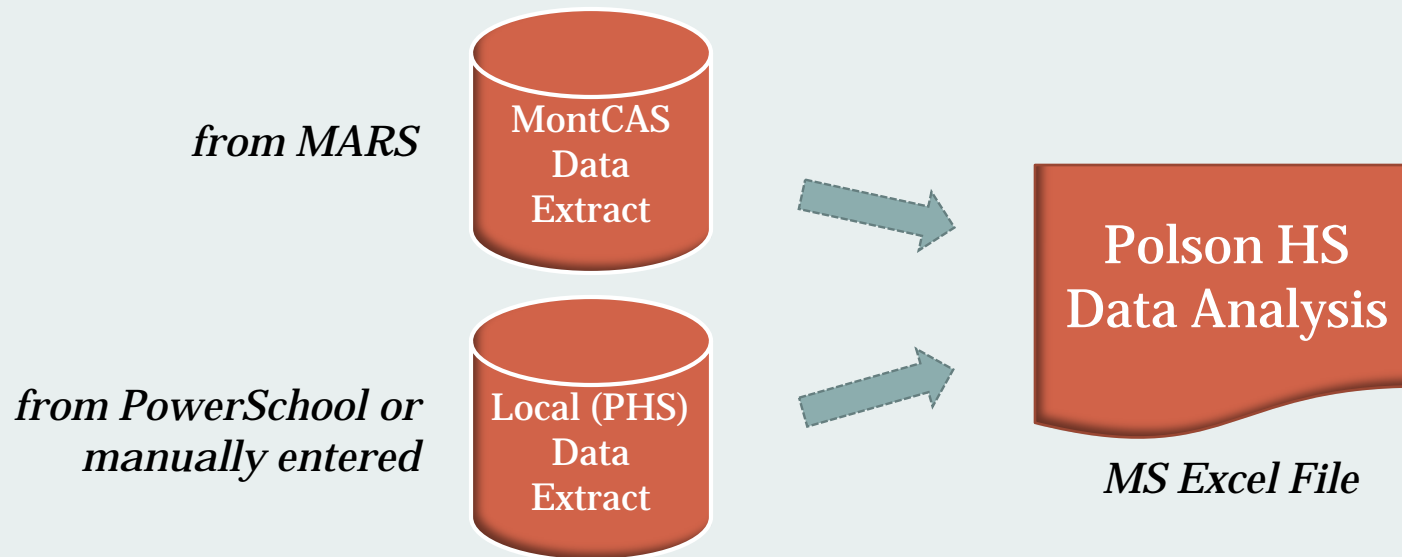
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- PHS did NOT Pass AYP for Math in 2007 or 2009
- Limited Understanding of Root Causes
  - Guessing at sources of failure and corrective action
  - Frustration within the department & school
  - Difficult to coordinate efforts to address the “gaps”
- MARS Analysis Tools Not Enough
  - Minimal Disaggregation using Pre-Formatted Reports
    - ✦ Drill-down and “what-if” analysis challenging
    - ✦ Unable to perform custom calculations & statistical analysis
  - No Integration with External (School-Level) Data
    - ✦ Math classes, grades, attendance...

# Using MS Excel for Data Analysis

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- MARS provides MS Excel Data Download
- PowerSchool provides MS Excel Data Extract
- Data linked by (Last Name + First Name) key



# Using MS Excel for Data Analysis

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- **Demonstrate features of Excel-based Analysis**
  - **Data Highlighting (Dynamic Formatting)**
    - ✦ Correct/incorrect answers
    - ✦ Thresholds highlighting (% correct)
  - **Data Integration**
    - ✦ PHS math class
    - ✦ 8<sup>th</sup> & 10<sup>th</sup> grade math, 10<sup>th</sup> grade reading
    - ✦ Option to add any available data
  - **Links to Problems**

# Using MS Excel for Data Analysis

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- **Demonstrate features of Excel-based Analysis**
  - **Sample Data Filtering (8<sup>th</sup> to 10<sup>th</sup> Grade Transition)**
    1. Summarize Starting Point (Totals, %AYP...)
    2. Remove “Transfers” (Blanks in 8<sup>th</sup> Grade)
    3. *“Reset” and Take a Quick Look at Transfers into PHS*
    4. Remove “Female” Students (Males Only)
    5. Remove “Male” Students (Females Only)

➤ What Questions/Hypotheses Come to Mind?
  - **Sample Reporting with Pivot Tables (AYP vs. Class Analysis)**
    1. Reset to Starting Point (Clear Filters)
    2. Demonstrate Post-Geometry vs. Pre-Geometry Results
    3. Show Pivot Table Report

# Using MS Excel for Data Analysis

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- **Actions taken as a result of detailed Data Analysis:**
  - Math Coach: Focus on Integration Between MS and HS
  - Assignment & Assessment Modifications
    - ✦ Explicitly selecting multi-step and word-based problems
    - ✦ Focus on showing and explaining all work
    - ✦ Continuous reinforcement of all standards in each class
  - Assignment Quality Expectations Strictly Enforced
  - Weekly Math Department Meeting
  - Modifications to HS and MS Curriculums (in progress)
  - MontCAS Preparation Activities in Classroom
    - ✦ Clicker System, CR Activities, Daily Warm-ups, Sample Tests
  - MontCAS Preparation Prep Period → Web-based Tools

# Web-Based Tools for Test Preparation

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- Repository of MontCAS-Related Materials

- Released Problems by Grade Level
- Review Worksheets
- Sample Tests (Assessments)
- Classroom-Support Tools
- Templates and Tools
- Other materials as developed...

- URL

- [http://www.polson.k12.mt.us/phs/staff/rnorthcutt/MontCAS/MontCAS\\_Home.html](http://www.polson.k12.mt.us/phs/staff/rnorthcutt/MontCAS/MontCAS_Home.html)

Polson High School  
MontCAS Mathematics Review

HOME PROBLEMS WORKSHEETS ASSESSMENTS MARS REPORTING MONTANA DPI OTHER STUFF

Grade 10 Grade 8 Grade 7 Grade 6 Grade 5 Grade 4 Grade 3

MontCAS 8th Grade Review

#	Year	STD	PSD%	MT%	Delta	Type	Topic
1	2009	2	80%	75%	5	MC	Decimal Operations
3	2009	2	47%	42%	5	MC	Ordering Real Numbers
9	2009	4	54%	54%	0	MC	Triangle Properties
10	2009	2	48%	53%	-5	MC	Properties of Real Numbers
18	2009	2	63%	66%	-3	MC	Real-World Situation
19	2009	3	40%	40%	0	CR	Evaluating Expressions
20	2009	3	70%	70%	0	CR	Writing & Solving Equations
23	2009	2	35%	32.5%	2	CR	Percentages
24	2009	2	56%	65%	-9	MC	Proportions
25	2009	4	44%	46%	-2	MC	Geometric Counterexamples
28	2009	4	84%	84%	0	MC	Figures
30	2009	5	71%	71%	0	MC	Pythagorean Theorem
35	2009	7	70%	59%	12	MC	Linear Functions
39	2009	7	84%	79%	5	MC	Linear Functions
40	2009	7	43%	36%	7	MC	Inductive Reasoning - Patterns
41	2009	5	70%	67%	3	MC	Circle Measures
42	2009	3	47%	46%	1	MC	Factoring Expressions
44	2009	6	72%	65%	7	MC	Graphing Data
46	2009	5	57%	54%	3	MC	Volume Measures
50	2009	4	31%	27%	4	MC	3-D Figures
51	2009	5	22%	18%	4	MC	Proportions
57	2009	4	45%	43%	2	MC	Symmetry
58	2009	6	53%	50%	3	MC	Probability
61	2009	4	43%	57%	-14	MC	Transformations
62	2009	6	51%	56%	-5	MC	Statistical Bias
65	2009	6	51%	51%	0	MC	Statistical Measures
68	2009	6	47%	45%	2	MC	Probability
70	2009	3	66%	62%	4	MC	Linear Equations
71	2009	6	77%	69%	8	MC	Scatter Plots

25. Study the statement below.  
A diagonal of a quadrilateral always divides the quadrilateral into two congruent triangles.  
Which quadrilateral will prove this statement false?  
A. rectangle  
B. rhombus  
C. square  
D. trapezoid

Geometric Counterexamples  
Problem #25 Year: 2009 Standard: 4 Percent Correct: 44%  
Review Worksheet: [Geometric Counterexamples](#)  
Assessment: [Geometric Counterexamples](#)  
[SHOW ANSWER](#)

MT Math Standards:  
2: Numbers & Operations  
3: Algebra  
4: Geometry  
5: Measurement  
6: Data Analysis, Statistics & Probability  
7: Patterns, Relations & Functions



# Web-Based Tools for Test Preparation

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- **Problems by Grade Level**
  - 2009 Problems - incrementally adding prior & future years
  - Grades 3-10
  - Polson vs. State-wide Comparison
  - Detailed Topic within Standards
  - Quick View of Problem - Full Screen for Presentation
  - Links to Answers, Worksheets, and Assessments (in progress)
- **Worksheets**
- **Assessments**
- **Other Tools**

# Experience & Lessons Learned

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- ↑ Understanding of MontCAS Testing & Data
- ↑ Excitement, Motivation & Long-term Optimism
- ↑ Communication & Teamwork
  - ✦ Within department, across departments & between schools
- ↑ Curriculum & Classroom Instructional Changes
- ↑ Leverage of Teacher's Time & Efforts (Reuse)
- ↑ Support from Administration

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*However, we don't yet know the impact on student's Math Skills or MontCAS Test Results - Does it help?*

# How You Can Use & Participate

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- **Website URLs (Home Page & MontCAS Page)**
  - <http://www.polson.k12.mt.us/phs/staff/rnorthcutt/default.htm>
  - [http://www.polson.k12.mt.us/phs/staff/rnorthcutt/MontCAS/MontCAS\\_Home.html](http://www.polson.k12.mt.us/phs/staff/rnorthcutt/MontCAS/MontCAS_Home.html)
- **Ways to Use/Help**
  - Use the website and provide feedback!
  - Develop worksheets, assessments or other materials to add to the repository for others to use (send them to me)
  - Share with your colleagues
- **Contact Information**

Robert Northcutt, Polson High School  
rlnmontana@gmail.com  
406-425-0774 (Cell)

# Time Permitting - “Hot Topic” Discussions

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- **Some “hot topic” discussions from data analysis:**
  - What does it mean for students to be “10<sup>th</sup> graders”?
  - Should students be moved to the next level without having demonstrated “at level” skills in math? (at any level)
  - What are the core skills required to be successful in mathematics? Relationship to MT Math Standards?
  - Focus on breadth/exposure vs. depth/mastery?
  - Factual, Procedural and Conceptual understanding - What are they? Impact on curriculum and teaching methods?
  - Parent/community response to more rigorous mathematics standards and stricter enforcement of “at level” requirements